

# PATENT SPECIFICATION



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## PROVISIONAL SPECIFICATION

### Improvements in and relating to Devices for Polishing the Rolls of Rolling Mills

We, FRANK COOPER, British Subject, and HARRY PONSONBY LLOYD, British Subject, both of Neath Steel Sheet & Galvanizing Company, Limited, of The 5 Neath Steel Sheet & Galvanizing Works, Melyncrythan, Neath, Glamorganshire, Wales, do hereby declare the nature of this invention to be as follows:—

This invention relates to devices for 10 polishing the rolls of rolling mills.

Hitherto, with the use of existing appliances, it has taken two or more men thirty or even forty minutes to polish two rolls of a rolling mill and in many cases 15 it has only been possible to polish one roll at a time, thus causing a considerable delay in the working of the mill.

It is the object of the present invention to provide a device whereby two rolls can 20 be polished simultaneously by one man in a much shorter period of time, usually in about five to seven minutes. The work in the mill is therefore not delayed or interfered with and there is no "holding-out" between heats other than that which 25 is absolutely necessary for "warming up" the bars to be rolled in a furnace.

According to the present invention the 30 device consists of a guide cramp bar, adapted to be secured in position relatively to a pair of rolls of a rolling mill, in which is guided a block through which passes an adjustable rod on which a polishing stone is mounted. The block is preferably 35 provided with a screw threaded bore whilst the rod is correspondingly screw threaded so that by relative rotation of the rod and block the stone can be adjusted relatively to the rolls. The 40 guide cramp bar is preferably slotted in the longitudinal direction thereof, whilst the block is of rectangular cross section for engagement with the slot so as to prevent it from turning whilst being 45 capable of being moved into any position along the length of the slot.

In carrying the invention into effect according to one example of construction 50 a guide cramp bar of rectangular cross section is provided with a longitudinal slot which passes from the front to the back of the bar and which is of length at

least equal to the length of the rolls of a rolling mill.

At its opposite ends the guide bar is 55 provided with rectangular projections, which are preferably narrower than the bar and extend either to the full depth or only half the depth of the bar. The upper surfaces of the projections are preferably in alignment with the upper surface of the bar.

The projections are adapted to engage 60 with grooves in the side frames of the mill in which they are adjustable so that the guide bar can be adjusted in the desired position relatively to the rolls to be polished, preferably in such a position that the slot in the guide bar extends parallel to the pass between two rolls. 65 The slot may be so arranged relatively to the pass that the central longitudinal axis of the slot is located in a plane passing centrally through the pass between the two rolls. The bar when once fixed in position is not moved during the polishing operation.

With the slot engages a rectangular 70 block which may extend throughout the depth of the slot or only through a portion of this depth. The end of the block adjacent the rolls is provided with outwardly extending lugs or flanges adapted to bear against the face of the guide bar turned towards the rolls.

In the block is provided an axial screw 75 threaded hole through which passes the threaded portion of a rod carrying at one end a head into which is fitted a polishing stone or member. The other end of the rod may be suitably shaped for engagement by a tool for rotating the same or may be provided with one or more holes for the reception of a tommy bar.

The polishing stone or member is 80 preferably of triangular shape, preferably with concave surfaces so as to fit into the pass between two rolls.

After the guide bar has been secured in 85 the desired position the rod can be readily 90 mounted therein by passing the rod, to which the block and polishing stone or member have been previously fitted, through the slot, from the side of the

guide bar turned towards the rolls, then engaging the block in the slot with the lugs or flanges bearing against the rear face of the bar, and then fitting the 5 polishing stone between the two rolls. The necessary pressure is applied to the polishing stone by turning the rod in the block by means of a tommy bar or a suitable tool. For carrying out the polishing 10 operation the block is moved from one end of the slot to the other until the polishing stone has produced the desired degree of polishing of both rolls.

The device enables a more polished and 15 uniform surface of the rolls to be produced than was hitherto possible and consequently enables sheet metal to be produced with a more polished surface than has been usual in the past during 20 hot rolling. As a result of experiments which have been made it has been found that less cutting away of the middle of the rolls is necessary during the periodic roll-turning which is usually effected at 25 week ends, so that the life of the rolls is considerably prolonged.

This is of great importance in the case of steel, especially in steel sheet, black

plate and tin plate mills where very soft steels are rolled to meet present day 30 demands.

By means of the device various advantages may be obtained, for example, two rolls can be polished in position, simultaneously and efficiently, cost of labour 35 for this purpose is reduced to a minimum as only one man is required and the operation only takes a few minutes, there is no interference with the ordinary work of the mill, the guide bar can remain fixed 40 in position throughout the working week, the rod with the polishing stone can be fitted easily and quickly into the guide bar when polishing is required, better surfaces are obtained on steel sheets, 45 black plate and tin plate during hot rolling, longer life of rolls, higher output by reason of short time required for polishing, and the friction caused by polishing between heats, prevents severe 50 and dangerous drop in roll temperature which otherwise frequently occurs between heats.

Dated this 26th day of July, 1935.

FRANK COOPER,  
HARRY PONSONBY LLOYD.

#### COMPLETE SPECIFICATION

#### Improvements in and relating to Devices for Polishing the Rolls of Rolling Mills

We, FRANK COOPER, a British Subject, 55 and HARRY PONSONBY LLOYD, a British Subject, both of Neath Steel Sheet & Galvanizing Company, Limited, of The Neath Steel Sheet & Galvanizing Works, Melyncrythan, Neath, Glamorganshire, 60 Wales, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

65 This invention relates to devices for polishing the rolls of rolling mills.

Hitherto, with the use of existing appliances, it has taken two or more men thirty or even forty minutes to polish two 70 rolls of a rolling mill and in many cases it has only been possible to polish one roll at a time, thus causing a considerable delay in the working of the mill.

75 It is the object of the present invention to provide a device whereby two rolls can be polished simultaneously by one man in a much shorter period of time, usually in about three to seven minutes. The work in the mill is therefore not delayed or 80 interfered with and there is no "holding-out" between heats other than that which is absolutely necessary for "warming up" the bars to be rolled in

a furnace.

According to the present invention the 85 device consists of a guide cramp bar, adapted to be secured in position relatively to a pair of rolls of a rolling mill, which is slotted in the longitudinal direction thereof, whilst a block of rectangular 90 cross section engages with the slot whereby the block is prevented from turning in the slot whilst being capable of being moved into any position along the length of the slot, this block being 95 provided with lugs or flanges which bear against the face of the guide cramp bar turned towards the rolls, an adjustable rod on which a polishing stone or member is mounted being passed through the 100 guide block. The block is preferably provided with a screw threaded bore whilst the rod is correspondingly screw threaded so that by relative rotation of the rod and block the stone can be 105 adjusted relatively to the rolls.

The invention will now be described with reference to the accompanying drawings, wherein:

Fig. 1 shows a perspective view of a 110 guide cramp bar with a rod, carrying a polishing stone mounted therein,

Fig. 2 is a side view of a rod carrying

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a polishing stone, and

Fig. 3 is a perspective view of a device according to the invention in the operative position relatively to a pair of rolls.

5 As shown in the drawings a guide cramp bar 1 of rectangular cross section is provided with a longitudinal slot 2 which passes from the front to the back of the bar and which is of length at least 10 equal to the length of the rolls 3, 4 of a rolling mill as shown in Fig. 3.

15 At its opposite ends the guide bar 1 is provided with rectangular projections 5, 6 which are preferably narrower than the bar 1 and extend either to the full depth or only half the depth of the bar 1, as shown in Fig. 1. The upper surfaces of the projections 5, 6 are preferably in alignment with the upper surface of the bar 1.

20 The projections 5, 6 are adapted to engage with grooves 7 in the side frames 8 of the mill in which they are adjustable so that the guide bar 1 can be adjusted 25 in the desired position relatively to the rolls 3, 4 to be polished, preferably in such a position that the slot 2 in the guide bar 1 extends parallel to the pass between two rolls such as 3 and 4. The slot 2 may 30 be so arranged relatively to the pass that the central longitudinal axis of the slot 2 is located in a plane passing centrally between the two rolls 3, 4. The bar 1 when 35 once fixed in position is not moved during the polishing operation, or during the process of rolling.

With the slot 2 engages a rectangular block 9 which may extend throughout the depth of the slot 2 or only through a 40 portion of this depth. The end of the block 9 adjacent the rolls is provided with outwardly extending lugs or flanges 10 adapted to bear against the face 11 of the guide bar 1 turned towards the rolls 3, 4.

45 In the block 9 is provided an axial screw threaded hole through which passes the threaded portion 12 of a rod 13 carrying at one end a head 14 into which is fitted a polishing stone or member 15. 50 The other end of the rod may be suitably shaped for engagement by a tool for rotating the same or may be provided with one or more holes 16 for the reception of a tommy bar 17.

55 The polishing stone or member 15 is preferably of triangular shape, preferably with concave surfaces so as to fit into the pass between two rolls such as 3 and 4.

60 After the guide bar 1 has been secured in the desired position the rod 13 can be readily mounted therein by passing the rod 13, to which the block 9 and polishing stone or member 15 have been 65 previously fitted, through the slot 2, from

the side 11 of the guide bar 1 turned towards the rolls 3, 4 then engaging the block 9 in the slot 2 with the lugs or flanges 10 bearing against the rear face 11 of the bar 1, and then fitting the polishing stone 15 between the two rolls 3, 4. The necessary pressure is applied to the polishing stone 15 by turning the rod 13 in the block 9 by means of a tommy bar 17 or a suitable tool. For carrying out the polishing operation the block 9 is moved from one end of the slot 2 to the other until the polishing stone 15 has produced the desired degree of polishing of both rolls 3, 4.

70 The device enables a more polished and uniform surface of the rolls to be produced than was hitherto possible and consequently enables sheet metal to be produced with a more polished surface than has been usual in the past during hot rolling. As a result of experiments which have been made it has been found that less cutting away of the middle of the rolls 3, 4 is necessary during the periodic roll-turning which is usually effected at week ends, so that the life of the rolls is considerably prolonged.

75 This is of great importance in the case of steel, especially in steel sheet, black plate and tin plate mills where very soft steels are rolled to meet present day demands.

80 By means of the device various advantages may be obtained, for example, two 100 rolls can be polished in position, simultaneously and efficiently, cost of labour for this purpose is reduced to a minimum as only one man is required and the operation only takes a few minutes, there 90 is no interference with the ordinary work of the mill, the guide bar 1 can remain fixed in position throughout the working week, the rod 13 with the polishing stone 105 15 can be fitted easily and quickly into the guide bar 1 when polishing is required, better surfaces are obtained on steel sheets, black plate and tin plate during hot rolling, longer life of rolls, higher output by reason of short time 115 required for polishing, and the friction caused by polishing between heats prevents severe and dangerous drop in roll temperature which otherwise frequently occurs between heats.

120 Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

125 1. A device for polishing the rolls of rolling mills consisting of a guide cramp bar, adapted to be secured in position relatively to a pair of rolls of a rolling mill, which is slotted in the longitudinal 130

direction thereof, whilst a block of rectangular cross section engages with the slot, whereby the block is prevented from turning in the slot, whilst being capable 5 of being moved into any position along the length of the slot, this block being provided with lugs or flanges which bear against the face of the guide cramp bar turned towards the rolls, an adjustable 10 rod, on which a polishing stone or member is mounted, being passed through the guide block.

2. A device according to claim 1,

wherein the block is provided with an axial screw threaded hole with which 15 engages a correspondingly threaded portion of the rod so that by rotation of the rod in the block the polishing stone or member is adjusted relatively to the rolls.

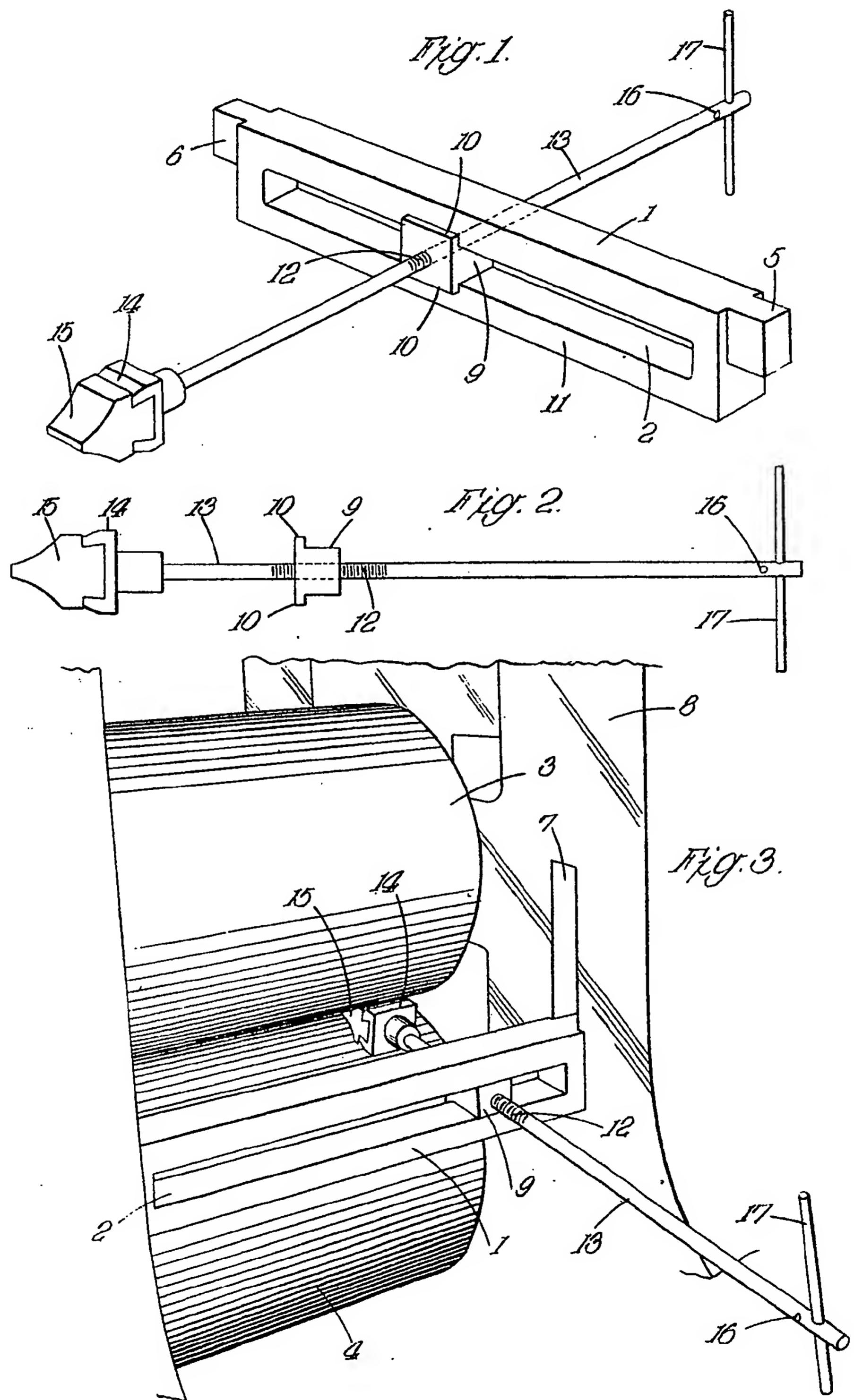
3. A device for polishing the rolls of 20 rolling mills, substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 11th day of October, 1935.  
FRANK COOPER,  
HARRY PONSONBY LLOYD.

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[This Drawing is a reproduction of the Original on a reduced scale.]



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